TABLE OF CONTENTS

Section			<u>Title</u>	Page
Chapter 3	Affecte	d Environment		3.1-1
3.1	Feature	es of the Physical	Environment in the Fisheries Management Units	3.1-1
	3.1.1		fic Ocean, Bering Sea, and Gulf of Alaska Ecosystems	
	3.1.2	Substrate		3.1-1
		3.1.2.1	Eastern Bering Sea	3.1-1
		3.1.2.2	Gulf of Alaska and Aleutian Islands Regions	
	3.1.3	Water Column		
		3.1.3.1	Gulf of Alaska and Aleutian Islands Regions	
		3.1.3.2	Bering Sea	
	3.1.4	Temper ature an	d Nutrient Regimes	
		3.1.4.1	Gulf of Alaska and Aleutian Islands Regions	
		3.1.4.2	Bering Sea	
	3.1.5			
	3.1.6			
	3.1.7		Regime Shifts	
		3.1.7.1	North Pacific Pressure Regime Changes	
		3.1.7.2	Bering Sea and Aleutian Islands and Gulf	
		0.117.12	of Alaska Regime Changes	. 3.1-13
	3.1.8	Potential Effect	of Global Climate Change	
		3.1.8.1	Atmospheric and Oceanic Changes in the Gulf of Alaska	
		3.1.8.2	Atmospheric and Oceanic Changes in the	. 0.1 10
		0.1.0.2	Bering Sea and Aleutian Islands	. 3.1-15
	3.1.9	Distant Forcing	g Parameters that Influence the	
			rea Ecosystem	. 3.1-16
3.2	Eichina	Coor Efforts on	Substantes and Bouthis Communities	221
3.2	3.2.1		Substrates and Benthic Communities	
	3.2.1	3.2.1.1	Bottom Tra wling Patterns in the Bering Sea	
		3.2.1.1	Effects of Bottom Trawling in the Bering Sea	
		3.2.1.3	Trawling Patterns in the Gulf of Alaska and Aleutian Islands	
		3.2.1.4	e	
		3.2.1.4	Trawling Effects in the Gulf of Alaska	
			Trawling Effects in the Aleutian Islands	. 3.2-11
		3.2.1.6	General Observations on Trawling Applicable to the North Pacific Ocean	2 2 11
	222	Dalacia Travel		
	3.2.2 3.2.3	•	Gear	
		•		
	3.2.4	Pot Gear		. 3.2-15
3.3	_		on Groundfish Resources	
	3.3.1		abitat, and Stock Status of Target Species	
		3.3.1.1	Pollock	
		3.3.1.2	Pacific Cod	
		3.3.1.3	Flathead Sole	
		3.3.1.4	Rock Sole	
		3.3.1.5	Greenland Turbot	
		3.3.1.6	Yellowfin Sole	. 3.3-20

TABLE OF CONTENTS (Cont.)

Section			<u>Title</u>	Page
		3.3.1.7	Arrowtooth Flounder	3.3-21
		3.3.1.8	Other Flatfish	
		3.3.1.9	Sablefish	
		3.3.1.10	Rockfish	3.3-26
		3.3.1.11	Atka Mackerel	3.3-36
		3.3.1.12	Squid and Other Species	3.3-43
		3.3.1.13	Forage Fish	3.3-48
	3.3.2	Ecological R	Relationships Between Target Species and Other Species	3.3-69
3.4	Marine	Mammals		3.4-1
	3.4.1	Pinnipedia		3.4-1
	3.4.2	Carnivora.		3.4-12
	3.4.3	Cetacea		3.4-13
	3.4.4	Ecological I	nteractions Between Marine	
		Mammals a	nd Commercial Fisheries	3.4-24
3.5	Seabird	S		3.5-1
	3.5.1	Seabird Life	e History, Population Biology, and Foraging Ecology	3.5-6
		3.5.1.1	Northern Fulmar	
		3.5.1.2	Storm-petrels	3.5-7
		3.5.1.3	Albatross	
		3.5.1.4	Shearwaters	3.5-13
		3.5.1.5	Cormorants	3.5-14
		3.5.1.6	Jaegers	3.5-14
		3.5.1.7	Gulls	3.5-14
		3.5.1.8	Kittiwakes	3.5-15
		3.5.1.9	Terns	3.5-16
		3.5.1.10	Murres	3.5-17
		3.5.1.11	Guillemots	3.5-18
		3.5.1.12	Auklets	3.5-18
		3.5.1.13	Murrelets	3.5-19
		3.5.1.14	Puffins	3.5-19
		3.5.1.15	Other Marine Birds	3.5-20
	3.5.2	Factors that	Influence the Availability of Food to Seabirds	3.5-23
		3.5.2.1	Oceanographic Factors	3.5-23
		3.5.2.2	Ecological Interactions Affecting Seabirds	3.5-26
	3.5.3	Seabird Res	sponses to Changes in Forage Availability	3.5-29
		3.5.3.1	Foraging Behavior and Flexibility	3.5-30
		3.5.3.2	Seabird Interactions with Each Other and	
			with Marine Mammals	3.5-30
		3.5.3.3	Population Responses of Seabirds to Changes in	
			Forage Availability	
	3.5.4		eabirds Catch in Fishing Gear	
		3.5.4.1	Incidental Catch on Longlines	
		3.5.4.2	Incidental Catch in Trawls	
		3.5.4.3	Vessel Strikes	3.5-43

TABLE OF CONTENTS (Cont.)

<u>ction</u>			<u>Title</u>	Page
	3.5.5	Processing Wa	stes and Discards	. 3.5-43
	3.5.6	Effects of Vess	els on Seabirds	
		3.5.6.1	Oil Spills	
		3.5.6.2	Introduced Mammalian Predators on Nesting Islands	. 3.5-45
		3.5.6.3	Plastics Ingestion	. 3.5-46
3.6	•			
	3.6.1		a and Epifauna	
		3.6.1.1	Eastern Bering Sea	
		3.6.1.2	Gulf of Alaska and Aleutian Islands	
		3.6.1.3	Aleutian Islands	
	3.6.2	Zooplankton .		
		3.6.2.1	Bering Sea	
	3.6.3	Shrimp		3.6-9
	3.6.4	Other Fish		. 3.6-12
		3.6.4.1	Gulf of Alaska	. 3.6-12
		3.6.4.2	Eastern Bering Sea	. 3.6-12
	3.6.5	Jellyfish		. 3.6-15
		3.6.5.1	Gulf of Alaska	. 3.6-15
		3.6.5.2	Eastern Bering Sea	. 3.6-15
3.7	Prohibite	ed Species		3.7-1
	3.7.1	Crab		3.7-2
		3.7.1.1	Life History and Stock Status	3.7-2
	3.7.2	Pacific Halibut		3.7-6
	3.7.3	Pacific Salmon		. 3.7-11
	3.7.4	Pacific Herring	5	. 3.7-17
	3.7.5	Prohibited Spec	cies Catch Management Measures	. 3.7-19
3.8	Contami	nants		3.8-1
3.9	Interaction	ons Among Clin	nate, Commercial Fishing, and Ecosystem	
	Relations	ships in the Nor	th Pacific Ocean: A Multispecies Perspective	3.9-1
	3.9.1	•	naracteristics	
		3.9.1.1	North Pacific Ocean	
		3.9.1.2	GOA Ecosystems	
		3.9.1.3	Eastern Bering Sea Ecosystem	
	3.9.2	Ecosystem Cha	aracteristics	
		3.9.2.1	Bering Sea	
		3.9.2.2	Summary of Traditional Knowledge of the	
		0.7.2.2	Bering Sea and GOA Ecosystems	. 3.9-14
3.10	Social an	nd Economic Co	onditions	. 3.10-1
			nd Overview	
			roces sing Sector Profiles	
	- · - • · -	3.10.2.1	Catcher Vessels	
				/

TABLE OF CONTENTS (Cont.)

Section			<u>Title</u>	Page
		3.10.2.2	Catcher/Processors	3.10-51
		3.10.2.3	Inshore Plants and Motherships	3.10-61
	3.10.3	Socioec onon	nic Profiles for Regions Involved in the	
		North Pacific	c Groundfish Fishery	3.10-76
		3.10.3.1	Alaska Peninsula and Aleutian Islands Region	3.10-83
		3.10.3.2	Kodiak Island Region	3.10-86
		3.10.3.3	Southcentral Alaska Region	3.10-89
		3.10.3.4	Southeast Alaska Region	
		3.10.3.5	Washington Inland Waters Region	
		3.10.3.6	Oregon Coast Region	
	3.10.4	Other Affect	ed Groups	3.10-102
		3.10.4.1	Community Development Program	
			Group Summary Profile	3.10-102
		3 10 4 2	Secondary Processors	3 10-105

TABLES

Table 3.1-1	Characteristics of Four Oceanographic Domains of the Eastern Bering Sea Shelf in Summer, 1978
Table 3.2-1	Groundfish Catch off Alaska by Area, Gear and Species Groups, 1994–1998 (1,000 mt, Round Weight)
Table 3.3-1	Estimated Catches of Other Species, Squid, Forage Fish, and Miscellaneous Fish by Groundfish Fisheries in the Bering Sea, Aleutian Islands, and Gulf of Alaska by Target Species Fishery and Gear, 1999, in Metric Tons
Table 3.3-2	The Diet of Selected Eastern Bering Sea Shelf Groundfish Species
Table 3.3-3	Diet of Selected Eastern Bering Sea Slope Groundfish Species
Table 3.3-4	Percent by Weight of Important Prey Consumed by Groundfish in the Gulf of Alaska
Table 3.3-5	Percent by Weight of Important Prey Consumed by Groundfish in the Aleutian Islands
Table 3.3-6	Estimated Populations and Principal Diets of Seabirds that Breed in the Bering Sea, Aleutian Islands, and Gulf of Alaska
Table 3.3-7	Comparative Population Estimates and Diets of Nonbreeding Seabirds That Frequent the Bering Sea and Aleutian Islands and Gulf of Alaska Regions
Table 3.3-8	Numbers of Northern Fur Seals, Steller Sea Lions, and Harbor Seals in Parts of the Gulf of Alaska and Bering Sea
Table 3.3-9	Rank of Prey Species in the Diets of Northern Fur Seals, Steller Sea Lions, and Harbor Seals in the Gulf of Alaska and Bering Sea
Table 3.3-10	Estimated Catch of Forage Fish by Target Fishery and Gear Type by Groundfish Fisheries in the Bering Sea and Aleutian Islands and the Gulf of Alaska, 1999, in Metric Tons
Table 3.5-1	Population Trends of Breeding Alaskan Seabirds: Fulmars, Storm-Petrels, Cormorants, and Gulls
Table 3.5-2	Population Trends of Alaskan Seabirds: Kittiwakes, Murres, and Guillemots
Table 3.5-3	Population Trends of Alaskan Seabirds: Auklets, Murrelets, and Puffins
Table 3.5-4	Population Trends for Kittiwakes and Murres at Selected Breeding Colonies in the Bering Sea
Table 3.5-5	Preliminary Annual Estimates, by Area, of Total Numbers and Bycatch Rates of Seabirds Taken in Longline Fisheries
Table 3.5-6	Preliminary Estimated Total Incidental Catch of Seabirds by Species or Species Groups in Bering Sea and Aleutian Islands and Gulf of Alaska Longline Fisheries, 1993–1999

Γable 3.5-7	Preliminary Estimated Total Incidental Catch of Seabirds by Species or Species Groups in the Combined Bering Sea and Aleutian Islands and Gulf of Alaska Trawl Fisheries, 1993–1999
Γable 3.5-8	Preliminary Estimated Total Incidental Catch of Seabirds by Species or Species Groups in the Combined Bering Sea and Aleutian Islands and Gulf of Alaska Pot Fisheries, 1993–1999
Γable 3.7-1	Productivity (in Metric Tons) and Status of Alaska Salmon Fishery Resources
Γable 3.7-2	Salmon Bycatch (in Numbers of Fish) in Groundfish Fisheries
Γable 3.7-3	Prohibited Species Catch Allocations for Bering Sea and Aleutian Islands Fishery Management Unit
Γable 3.7-4	Prohibited Species Catch Allocations by Zone for Crab in the Bering Sea and Aleutian Islands Fishery Management Unit
Γable 3.7-5	Prohibited Species Catch Allocations for the Gulf of Alaska Fishery Management Unit
Γable 3.8-1	Organic Contaminants and Major and Trace Elements Recently Measured as Part of NOAA's National Status and Trends Program
Γable 3.8-2	NOAA's Mus sel Watch Sites in Alaska
Γable 3.8-3	$\label{eq:mean_concentration} \mbox{ (g/g Dry Weight) of S elected Toxic Elements in Sediment Samples in the United States Arctic}$
Γable 3.10-1	Summary of Domestic Groundfish Fishing and Processing, 1991–1998
Γable 3.10-2	Summary of Groundfish Fishing and Processing by Sector, 1998
Γable 3.10-3	Catcher Vessel Sectors
Γable 3.10-4	Summary of North Pacific Groundfish Catcher Vessel Activities, 1991–1998
Γable 3.10-5	Summary of Catcher Vessel Activity in the Groundfish Fishery, 1998
Γable 3.10-6	Participation for American Fisheries Act-Qualified Trawl Catcher Vessels with Crab Endorsements, 1988–1998
Γable 3.10-7	Participation Summary of American Fisheries Act-Qualified Trawl Catcher Vessels without Crab Endorsements, 1988–1998
Γable 3.10-8	Participation Summary for Non-American Fisheries Act Trawl Catcher Vessels Greater Than or Equal to 60 Feet in Length, 1988–1998
Гable 3.10-9	Participation Summary for Trawl Catcher Vessels Less Than 60 Feet in Length, 1988–1998

Table 3.10-10	Participation Summary for Pot Catcher Vessels, 1988–1998
Table 3.10-11	Participation Summary for Longline Catcher Vessels, 1988–1998
Table 3.10-12	Participation Summary for Fixed-Gear Catcher Vessels 33 to 59 Feet in Length, 1988–1998
Table 3.10-12	Participation Summary for Fixed-Gear Catcher Vessels 33 to 59 Feet in Length, 1988–1998
Table 3.10-13	Participation Summary of Fixed-Gear Catcher Vessels Less Than or Equal to 32 Feet in Length, 1998–1998
Table 3.10-14	Summary of Catcher Processor Activities in the North Pacific Groundfish Fisheries, 1991–1999
Table 3.10-15	Summary of Catcher/Processors Activities by Class, 1999
Table 3.10-16	Participation Summary of Surimi Trawl Catcher/Processors
Table 3.10-17	Participation Summary for Fillet Trawl Catcher/Processors, 1991–1999
Table 3.10-18	Participation Summary for Head-and-Gut Trawl Catcher/Processors, 1991–1999
Table 3.10-19	Participation Summary for Pot Catcher Processors, 1991–1999
Table 3.10-20	Participation Summary for Longline Catcher/Processors, 1991–1999
Table 3.10-21	Summary of Inshore Processor and Mothership Activities in the North Pacific Groundfish Fisheries, 1991–1999
Table 3.10-22	Summary of Inshore Processor and Mothership Activities by Class, 1999
Table 3.10-23	Participation Summary for Bering Sea Pollock Inshore Plants, 1991–1999
Table 3.10-24	Participation Summary for Alaska Peninsula and Aleutian Islands Inshore Plants, 1991–1999
Table 3.10-25	Participation Summary for Kodiak Island Inshore Plants, 1991–1999
Table 3.10-26	Participation Summary for South Central Alaska Inshore Plants, 1991–1999
Table 3.10-27	Participation Summary for Southeast Alaska Inshore Plants, 1991–1999
Table 3.10-28	Participation Summary for Motherships, 1991–1999
Table 3.10-29	Selected North Pacific Groundfish Participation Measures by Region, 1998
Table 3.10-30	Groundfish Harvests Delivered to Inshore Plants by Species, 1999

Table 3.10-31	Retained Harvest by Catcher Vessels Owned by Residents of Various Regions by Fisheries Management Plan Subarea, 1998
Table 3.10-32	Retained Harvest by Species by Catcher Vessel Owners by Region, 1998
Table 3.10-33	North Pacific Groundfish Fishery Participation Measures for the Alaska Peninsula and Aleutian Islands Region by Year, 1991–19
Table 3.10-34	Groundfish Reportedby Bering Sea Pollock and Alaska Peninsula and Aleutian Island Inshore Plants by Species, 1999
Table 3.10-35	Retained Harvest by Catcher Vessels Owned by Residents of the Alaska Peninsula and Aleutian Islands Region by Fishery Management Plan Subarea, 1998
Table 3.10.36	Retained Harvest by Catcher Vessels Owned by Residents of the Alaska Peninsula and Aleutian Islands Region by Species, 1998
Table 3.10-37	North Pacific Groundfish Fishery Participation Measures for the Kodiak Island Region by Year, 1991–1999
Table 3.10-38	Groundfish Reported by Kodiak Inshore Plants by Species, 1999
Table 3.10-39	Retained Harvest by Catcher Vessels Owned by Residents of the Kodiak Region by Fishery Management Plan Subarea, 1998
Table 3.10-40	Retained Harvest by Catcher Vessels Owned by Residents of the Kodiak Region by Species, 1998
Table 3.10-41	NorthPacific Groundfish Fishery Participation Measures for the South Central Alaska Region by Year, 1991–1999
Table 3.10-42	Groundfish Reported by South Central Alaska Inshore Plants by Species, 1999
Table 3.10-43	Retained Harvest by Catcher Vessels Owned by Residents of the South Central Alaska Region by Fishery Management Plan Subarea, 1998
Table 3.10-44	Retained Harvest by Catcher Vessels Owned by Residents of the Southcentral Alaska Region by Species, 1998
Table 3.10-45	North Pacific Groundfish Fishery Participation Measures for the Southeast Alaska Region by Year, 1991–1999
Table 3.10-46	Groundfish Reported by BS Pollock and Southeast Alaska Inshore Plants by Species, 1999
Table 3.10-47	Retained Harvest by Catcher Vessels Owned by Residents of the Southeast Alaska Region by Fishery Management Plan Subarea, 1998

Table 3.10-48	Retained Harvest by Catcher Vessels Owned by Residents of the Southeast Alaska Region by Species, 1998
Table 3.10-49	North Pacific Groundfish Fishery Participation Measures for the Washington Inland Waters Region by Year, 1991–1999
Table 3.10-50	Groundfish Reported by Washington Inland Waters Inshore Plants by Species, 1999
Table 3.10-51	Retained Harvest by Catcher Vessels Owned by Residents of the Washington Inland Waters Region by Fishery Management Plan Subarea, 1998
Table 3.10-52	Retained Harvest by Catcher Vessels Owned by Residents of the Washington Inland Waters Region by Species, 1998
Table 3.10-53	North Pacific Groundfish Fishery Participation Measures for the Oregon Coast Region by Year, 1991–1999
Table 3.10-54	Groundfish Reported by Oregon Coast Inshore Plants by Species, 1999
Table 3.10-55	Retained Harvest by Catcher Vessels Owned by Residents of the Oregon Coast Region by Fishery Management Plan Subarea, 1998
Table 3.10-56	Retained Harvest by Catcher Vessels Owned by Residents of the Oregon Coast Region by Species, 1998
Table 3.10-57	Primary Products for Alaska Groundfish, Percent of Total Products by Species and Year, 1991–1999 Chapter

FIGURES

- Figure 3.1-1 General surface circulation and major current systems of the north Pacific Ocean.
- Figure 3.1-2 Mean diameter of sediment grains (†) at 994 sample locations, shown according to seven divisions of the range of sample values illustrating the spatial variation of bottom sediments. Insert is larger scale view of St. George and St. Paul Pribilof Islands and vicinity.
- Figure 3.1-3 High-resolution textural class of grain size analysis samples (n = 903). Insert is larger-scale view of St. George and St. Paul Pribilof Islands and vicinity.
- Figure 3.1-4 Estimates of climatological mean surface circulation in the subarctic Pacific Ocean.
- Figure 3.1-5 Maximum (1976) and minimum (1979) extent of sea ice in the Bering Sea in recent years.
- Figure 3.1-6 The North Pacific Index (NPI), area-averaged Sea Level Pressure anomaly in the region 160°E–140°W, 30°–65°N over winter–spring (December–May) seasons (solid curve), and the respective averages for 1899–1924, 1925–1947, 1948–1976, and 1977–1997 (dashed lines).
- Figure 3.1-7 Winter sea surface temperature anomalies (°C) at (a) the Pribilof Islands in the EBS; (b) ocean station GAK 1 south of Seward, Alaska, in the western Gulf of Alaska; (c) Kains' Island in the southern Gulf of Alaska off the British Columbia coast; and (d) ice cover in the Bering Sea represented by the anomaly (° latitude) of the latitude of ice extent along 167°W. The ordinate (y axis) of each graph has been normalized in units of standard deviation.
- Figure 3.2-1 Location and intensity of bottom trawl efforts in the Bering Sea, 1973–1997.
- Figure 3.2-2 Species diversity of benthic invertebrate megafauna in heavily fished (HF) and unfished (UF) areas by station pairs in the eastern Bering Sea. Overall, diversity in the UF area was significantly greater than in the HF area.
- Figure 3.2-3 Location and density of bottom trawl efforts in the Gulf of Alaska, 1990–1998.
- Figure 3.2-4 Locations and density of bottom trawl effort in the Aleutian Islands, 1990–1998.
- Figure 3.2-5 Estimated bottom trawl time in the Gulf of Alaska and Aleutian Islands, 1990–1998.
- Figure 3.2-6 Estimates of area closured to groundfish trawling in the Bering Sea/Aleutian Islands and Gulf of Alaska, 1987-1998 (not including trigger closures or seasonal extensions around selected sea lion rookeries).
- Figure 3.3-1 Distribution of fishery operations during 1998–1999. A-Season represents pollock caught during January 20–March 31, B-Season represents pollock caught during the second half of the calendar year.
- Figure 3.3-2 Distribution of observed trawl locations in the Gulf of Alaska where pollock was the target species, 1996.
- Figure 3.3-3 Projected age distribution (year classes noted on top of bars) and long-term average (solid line) for eastern Bering Sea pollock, 2000.
- Figure 3.3-4 Estimated population at age for walleye pollock in the western and central regulatory areas of the Gulf of Alaska, 1990–1997.
- Figure 3.3-5 Estimated population at age for walleye pollock in the western and central regulatory areas of the Gulf of Alaska, 1972–1979.

FIGURES (Cont.)

- Figure 3.3-6 Estimated age composition of Bering Sea and Aleutian Islands Atka mackerel, 1998.
- Figure 3.3-7 Observed Atka mackerel fishery locations in the Aleutian Islands region in 1998. Trawl exclusion zones, Steller sea lion critical habitat zones around rookeries and haulouts, the 200-m isobath, management Areas 541–543, and names of locations fished are shown.
- Figure 3.3-8 Observed Atka mackerel fishery locations in the Aleutian Islands region in 1999. Trawl exclusion zones, Steller sea lion critical habitat zones around rookeries and haulouts, the 200-m isobath, management Areas 541–543, and names of locations fished are shown.
- Figure 3.3-9 Distribution of capelin, rainbow smelt, and eulachon in Alaska Fisheries Science Center summer groundfish trawl surveys.
- Figure 3.3-10 Trophic interactions of key eastern Bering Sea groundfish.
- Figure 3.3-11 Trophic relationships of the groundfishes in the Gulf of Alaska.
- Figure 3.3-12 Trophic relationships of the groundfishes in the Aleutian Islands.
- Figure 3.4-1 Steller sea lion range. The population is most abundant in the core region from the Kenai Peninsula to Kiska Island.
- Figure 3.4-2 Length-frequency distributions of walleye pollock caught by the fishery, consumed by Steller sea lions, and the population based on the NMFS bottom trawl survey in spring and summer of 1981 in the Bering Sea. Fishery (April–June) and survey (July–September) length-frequencies were from collections in NMFS statistical Area 521, northwest of the Pribilof Islands. Steller sea lions (n = 27) were collected pelagically in Area 521 in April. Pollock length data were computed from otoliths found in sea lion stomachs.
- Figure 3.4-3 Length-frequency distribution of walleye pollock consumed by Steller sea lions and the 1985 Gulf of Alaska population based on stock-synthesis model output. Steller sea lions were collected in the Kodiak Archipelago in summer 1985. Pollock length data were computed from otoliths found in sea lion stomachs.
- Figure 3.5-1 Seabird colonies of Alaska.
- Figure 3.5-2 Short-tailed albatross distribution and sightings, 1905–1996. The birds can be in any part of their range during any months in which open water is present.
- Figure 3.5-3 Average annual number of seabirds taken by gear types in both the Bering Sea and Aleutian Islands and Gulf of Alaska, 1993–1999.
- Figure 3.5-4 Relative species composition of bird incidental catch in the longline fisheries in the Bering Sea and Aleutian Islands. Average annual estimates, 1993–1999.
- Figure 3.5-5 Relative species composition of bird bycatch in the longline fisheries in the Gulf of Alaska. Average annual estimates, 1993–1999.
- Figure 3.6-1 Zooplankton density estimates from line 8 transect samples in the Gulf of Alaska.
- Figure 3.6-2 Zooplankton biomass estimates in the eastern Bering Sea.

FIGURES (Cont.)

Figure 3.6-3 Relative abundance of northern pink shrimp (Pandalus borealis), humpy shrimp (P. goniurus), side-stripe shrimp (Pandalopsis dispar), and coonstripe shrimp (Pandalus hypsinotus) in the Gulf of Alaska, 1973–1997, from small-mesh trawl surveys (data smoothed with three-year running average). Figure 3.6-4 Longsnout prickleback abundance trends in the Gulf of Alaska from small-mesh trawl surveys, 1973–1997 (three-year running average). Figure 3.6-5 Changes in population estimates for a variety of noncommercial fish species in the eastern Bering Sea, showing a similarity in trends. Species include sculpins, eelpouts, poachers, snailfish, ronquils, and grænlings. Figure 3.6-6 Jellyfish abundance trends in the Gulf of Alaska from small-mesh trawl surveys, 1973–1997 (smoothed with a three-year average). Figure 3.6-7 Biomass (metric tons) of jellyfish medusae in the eastern Bering Sea from bottom trawl surveys, 1979-1998. Figure 3.7-1 Management areas involving prohibited species and walrus in the Bering Sea. Figure 3.7-2 Management areas involving prohibited species in the Bering Sea and Gulf of Alaska. Figure 3.7-3 Commercial landings of Alaska salmon, all species, 1970–1997, by metric tons and numbers of fish. Figure 3.7-4 Historical trend of Pacific herring catch in the Bering Sea and the Gulf of Alaska, 1900-1998. Figure 3.7-5 Areas closed to nonpelagic trawl gear in the Gulf of Alaska near Kodiak Island. Figure 3.7-6 Locations of areas closed to protect marine mammals or their feeding habitat. Figure 3.9-1 Estimated trend in the combined catch per unit of effort (CPUE) of 72 groundfish taxa from 1984–1996, averaged over Gulf of Alaska shelf and upper slope to 500m. Figure 3.9-2 Trend in index of species composition based on ordination of species abundance data from five triennial surveys on Gulf of Alaska shelf and slope with approximate 95 percent confidence interval. Figure 3.9-3 Relative species composition for major groundfish taxa in the Gulf of Alaska from 1961-1996. Biomass trends in Bering Sea trophic guilds, 1979–1998. Figure 3.9-4 Results from the multispecies and single species models for change in equilibrium biomass Figure 3.9-5 between the present fishing rates (F_{REF}) and more even harvesting of all species (F_{ABC}) .

Figure 3.9-6

present fishing strategy (F_{REF}) and a no fishing scenario.

Percent change in single species and multispecies model predictions of biomass between the

FIGURES (Cont.)

- Figure 3.9-7 Eastern Bering Sea flatfish instantaneous fishing mortality rates (F) as a function of total standardized trawling effort. Results were obtained from a multispecies yield per recruit model, and each species incorpor ates the contribution of all eastern Bering Sea trawl fisheries. Triangles indicate the $F_{40\%}$ single-species reference points, asterisks indicate the recent average Fs and total trawl standardized effort, and squares indicate the $F_{40\%}$ multi-species reference point for the flatfish complex as a whole.
- Figure 3.10-1 Domestic harvests in major Alaska fisheries, 1975–1980.
- Figure 3.10-2 Foreign and domestic harvests in major Alaska fisheries, 1977–1980.
- Figure 3.10-3 Foreign, joint venture, and domestic groundfish fishing and processing, 1977–1998.
- Figure 3.10-4 Volume of domestic processing of groundfish and non-groundfish species from Alaska waters, 1975–1998.
- Figure 3.10-5 Value of domestic processing of groundfish and non-groundfish species from Alaska waters, 1975–1998.
- Figure 3.10-6 Total groundfish harvests by species, 1991–1998.
- Figure 3.10-7 Primary production of Alaska pollock, 1995–1999.
- Figure 3.10-8 Surimi produced in Alaska, 1995–1999.